

Chapter 7b: RECOVER Activities

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SUMMARY AND HIGHLIGHTS

RECOVER is an interagency, interdisciplinary team sponsored by the USACE and the SFWMD. The role of RECOVER is to organize and apply scientific and technical information in ways that are most effective in supporting the objectives of CERP, and in ensuring that the systemwide goals and purposes of the plan are achieved. RECOVER applies science and the tools of science to three broad mission areas of systemwide evaluation, assessment and planning. These linkages provide RECOVER with the scientific basis for meeting its overall objectives of evaluating and assessing CERP performance, refining and improving the plan during the implementation period, and ensuring that a systemwide perspective is maintained throughout the restoration program.

RECOVER is developing an adaptive management program for CERP. The adaptive assessment process within the program will measure how well the desired goals of CERP are achieved and provide a “feedback mechanism” for assessing whether or not the responses by the systems being restored match expectations. These assessments will be used to determine when and how the programs could be improved in situations where the expectations are not being met. The ultimate role of adaptive management in CERP is to have an ongoing, scientifically based process for substantially increasing the probability that the plan will be successful.

RECOVER continues the evaluation process that began during the development of CERP. It continues to develop and refine models, such as the South Florida Water Management Model (SFWMM) and the Natural Systems Model (NSM) that were used during the development of CERP. Also, water quality is being evaluated in the Greater Everglades region using the Everglades Landscape Model (ELM). A Total System Conceptual Ecological Model is being developed to evaluate the interactions among the regional conceptual models and the upstream and downstream effects of what happens across boundaries.

Several of the projects currently being undertaken by RECOVER will allow tracking of CERP performance. Development of a *CERP Monitoring and Assessment Plan* (MAP) has continued and the second draft will be distributed in September 2002. The MAP establishes the framework for measuring **systemwide** responses and for assessing how well CERP is meeting its goals and objectives. As part of this process, monitoring and assessment performance measures have been developed. Also, a process for establishing interim goals has been developed.

To provide the informed public and legislators with an indication of the performance of CERP, a CERP Annual Report Card is being developed. The initial report will cover baseline or pre-CERP conditions. Successive report cards are intended to provide an indication of improvements or other changes brought about by the implementation of CERP.

The Initial CERP Update is currently under way in response to environmental changes and new information gained since the CERP feasibility report (USACE and SFWMD, 1999) was released. The Initial CERP Update will result in a clearer picture of plan performance, and a revised existing condition and future without project condition. Moreover, this information will be provided to the individual CERP project delivery teams (PDTs) as they begin project-level formulation and evaluation.

INTRODUCTION

RECOVER is an interagency, interdisciplinary team sponsored by the USACE and the SFWMD. The role of RECOVER is to organize and apply scientific and technical information in ways that are most effective in supporting the objectives of CERP, and in ensuring that the systemwide goals and purposes of the plan are achieved. RECOVER applies science and the tools of science to three broad mission areas of systemwide evaluation, assessment and planning. These linkages provide RECOVER with the scientific basis for meeting its overall objectives of evaluating and assessing CERP performance, refining and improving the plan during the implementation period, and ensuring that a systemwide perspective is maintained throughout the restoration program.

RECOVER's three mission areas are as follows:

- **Evaluation** - to work with the project delivery teams to evaluate (through modeling) and maximize the contribution made by each project to the systemwide performance of CERP
- **Assessment** - to measure (through monitoring) and interpret actual responses in the natural and human systems as CERP projects are brought on line
- **Planning and Integration** - to identify potential improvements in the design and operation of CERP, consistent with plan objectives, and to strive for consensus regarding scientific and technical aspects of the plan.

The process of "evaluation" refers to the analysis of the predicted performance of CERP projects in the context of the whole program. Plan and project performance is forecasted through the use of predictive simulation modeling. "Assessment" is the process by which the actual performance of implemented projects is measured and interpreted, based on data gathered from the systemwide monitoring and assessment plan.

More detailed information regarding the RECOVER program of CERP is contained in the *Management Plan for Restoration Coordination and Verification (RECOVER)*¹ (USACE and SFWMD, 2001a) and in the *2002 Everglades Consolidated Report* (SFWMD, 2002). This section of Chapter 7 will focus on RECOVER activities organized by its mission areas, for the period of September 2001 to August 2002.

¹ The management plan is available at www.evergladesplan.org/pm/recover/recover.shtml

RECOVER ACTIVITIES

RECOVER is a systemwide program of CERP. Evaluation, assessment and planning and integration activities will encompass all CERP projects, pilot projects and critical projects, as appropriate. RECOVER may also evaluate other non-CERP projects that can potentially affect CERP's ability to achieve its goals and purposes. RECOVER will function throughout the entire duration of the CERP process, continuously seeking ways to improve the plan as responses measured by a systemwide monitoring and assessment plan are used to direct the adaptive management program. Evaluation and assessment activities, as well as data from research and new technologies, will shape planning and integration efforts towards this goal.

The functions of RECOVER's three mission areas are the primary means of improving the performance of CERP as implementation of the individual projects proceeds. Figure 7b-1 depicts this relationship.

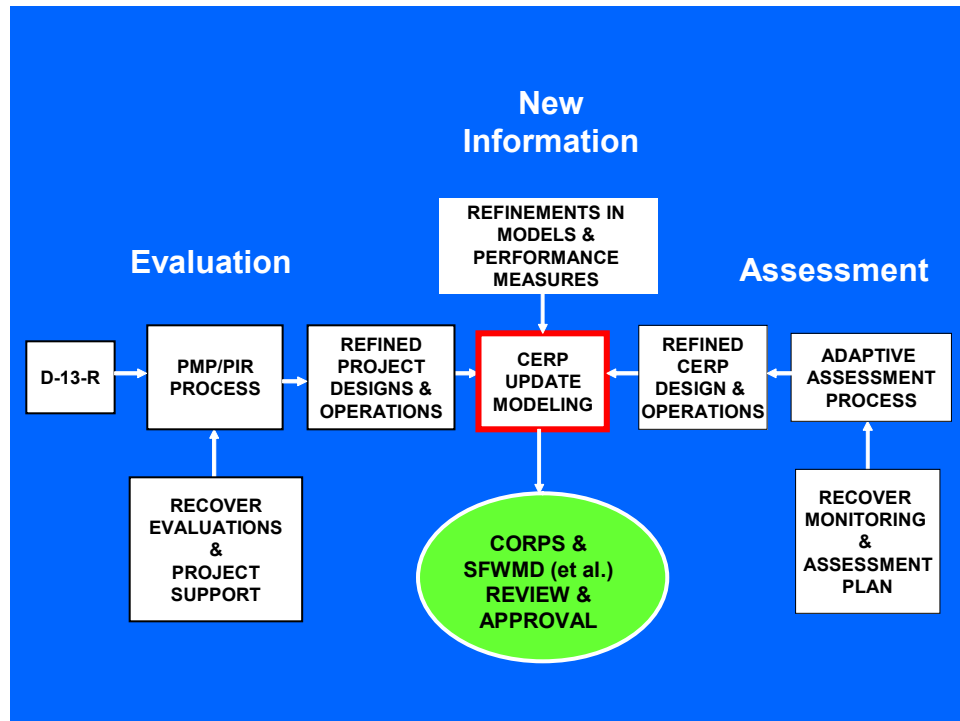


Figure 7B-1. The Relationship between the three missions of RECOVER and CERP Implementation

EVALUATION

Conceptual Ecological Models

As reported in last year's Everglades Consolidated Report (SFWMD, 2002), conceptual ecological models have been developed that represent the major wetland physiographic regions of South Florida. The models have served as the basis for the development of performance measures used in both the evaluation and assessment missions of RECOVER. As the models have been

revised, so too have the performance measures used in evaluating the hydrologic performance of CERP and its projects. The second revision of the models was published in the March 2001 draft of the *CERP Monitoring and Assessment Plan* (RECOVER, 2001b)².

The latest conceptual ecological model in preparation is for the total system in South Florida. The reason for the development of the Total System Conceptual Ecological Model is to integrate the major, systemwide working hypotheses that are common to several or all of the regional conceptual models. The model is designed to show the ecological linkages among the working hypotheses that explain the important effects of systemwide stressors on the Greater Everglades Ecosystem. These stressors, which include sea level rise, water management practices, changes in land use patterns and exotics, certainly echo those seen in many of the regional models.

The Total System Model identifies the working hypotheses that explain the major ecological changes that have occurred at the larger scale of the Greater Everglades. It also addresses whether there are major stressors and ecological effects that, because they are operating at such a large scale, have not been adequately characterized by the regional models. The Total System Model looks at the bigger picture, to pick up where the regional models leave off. It looks at the interactions among the regional models and at the upstream and downstream effects of what happens across boundaries. The draft model is scheduled for completion in winter 2002.

Regional Evaluation Team Revision of Hydrologic Performance Measures

A key tenet of South Florida ecosystem restoration is that hydrologic restoration is a necessary starting point for ecological restoration. Altered hydrology appears as a stressor in all the conceptual ecological models. Based on this premise, stressor-based performance measures were developed during the feasibility phase of CERP by the Alternative Evaluation Team to set a number of hydrologic targets for restoration that could be simulated by hydrologic models as a basis for evaluating alternative plans.

The Alternative Evaluation Team identified the hydrologic performance measures and targets that best defined restoration. This set of performance measures measured how well each alternative plan achieved those hydrologic targets. The Alternative Evaluation Team refined this set of performance measures during the two-year alternative plan formulation and evaluation process from a much larger set of potential measures generated by the hydrologic models. The Regional Evaluation Team of RECOVER continues to perform this function and has refined several performance measures since completion of the feasibility report for CERP. These revisions incorporated new scientific information about the ecology of the major landscapes and changes to the primary tools (SFWMM and NSM) used to evaluate alternative plans. In addition, the Water Quality Team is refining measures that can be used with the ELM to assess systemwide predicted changes in water quality and nutrient loading in the greater Everglades. The hydrologic and water quality performance measures listed in Table 7b-1-1, Appendix 7b-1, represent the current set of performance measures necessary to evaluate changes in the stressors that will achieve the goals of CERP.

The hydrologic performance measures presented in Appendix 7b-1, define multiple facets of how the natural and human systems depend on water. The performance measures define

² The March 2001 draft of the Monitoring and Assessment Plan is available at www.evergladesplan.org/pm/recover/recover_cerp_monitor_plan_1.shtml

hydropatterns for the different Everglades ecosystems, e.g., ridge and slough, marl prairie, the range of water flows to sustain estuaries and bays, and the ability to meet the water supply and flood protection needs of the human systems.

Regional Evaluation Team Evaluation of the Indian River Lagoon South and Water Preserve Areas Feasibility Studies

The Indian River Lagoon South and Water Preserve Areas Feasibility Studies were initiated prior to completion of the *Central and Southern Florida Project Comprehensive Review Study, Final Integrated Feasibility Report and Programmatic Environmental Impact Statement* (USACE and SFWMD, 1999), but did not move forward in earnest until its completion. These two feasibility studies are the first attempts to refine the conceptual design of CERP. They also represent the first attempts to evaluate alternative plans to CERP at both regional- and project-level scales. The Regional Evaluation Team reviewed several alternative plans as well as the recommended plans. The Regional Evaluation Team was able to conclude that the recommended plans for both studies performed as well as or better than CERP.

Indian River Lagoon South Evaluation

The Regional Evaluation and Water Quality Teams reviewed three alternative plans developed by the study team. Simulation 1A was designed to match CERP as closely as possible. It used storage features alone to meet the original goal of matching salinity distributions in the estuary. Alternatives 1B and 1C made further attempts to maximize local benefits and enhance regional benefits by adding wetland restoration, additional storage, water quality features, water conveyance flexibility, and muck removal features. When simulated within the context of the rest of the South Florida ecosystem, the three Indian River Lagoon South simulations performed almost identically to CERP. Although performance within the footprint of the project varied, it was concluded that any of the alternatives would be capable of providing the same level of benefits to the system as a whole as CERP. The most significant improvements to the systemwide performance due to plan alternatives were related to improved water supply in the Lake Okeechobee and Lower East Coast Service Areas.

Water Preserve Areas Evaluation

The Regional Evaluation Team reviewed two alternatives and two scenarios for the recommended plan for this feasibility study. In the study, plan formulation was iterative, enabling the incorporation of Regional Evaluation Team recommendations into the next alternative design. All four designs were expected to provide levels of benefits comparable to CERP. Performance in WCA 2B, WCA 3A, Everglades National Park and Biscayne Bay did not perform quite as well as necessary in some of the alternatives. The Water Preserve Areas Preliminary Selected Plan (the recommended plan) model simulation performs almost identically to CERP in most areas within the region. Performance in Everglades National Park, Biscayne Bay, and the Lower East Coast Service Area 2 varies somewhat from CERP, but this was not necessarily due to Water Preserve Areas components. Changes in other model assumptions affected the performance.

ASSESSMENT

CERP Annual Report Card

The objective of the CERP Annual Report Card is to provide a report to the public on how the natural and human systems are responding to the influences of CERP, and to explain why the observed responses are occurring. To meet these objectives, the report card will use a set of “key indicators” of environmental health for both natural and human systems in South Florida as a way of informing the public and decision makers on the progress of the plan. An example of a key indicator is the total area of healthy oyster beds in the St. Lucie Estuary. The CERP target for oyster beds in the St. Lucie Estuary is to increase their area by 4.5 times. As the CERP is implemented, the area will be measured periodically and the level of restoration will receive a grade.

The CERP Annual Report Card will provide an annual grade for each of the key indicators. The range of grades for the full set of key indicators is intended to be representative of the success that CERP is having in meeting its goals. These grades will be based on assessments of each of the indicators on an annual basis during the implementation of CERP. For most key indicators, one or more interim goals will be developed, in addition to the final goal(s). These interim goals will show the levels of improvement that are expected at appropriate intervals during the implementation of the plan. These interim goals will be added to the report card in the next one to two years.

The *Draft 2001 CERP Annual Report Card* is presented in Appendix 7b-2. It reports on the status of 14 key indicators. The *2001 Annual Report Card* is the first annual report card for the initial elements of CERP. Now in the earliest stages of implementation, CERP is not expected to yet show effects on the indicators of the health of the Everglades basin. Thus the grades reported in this report card are indicative of baseline or pre-CERP conditions rather than of any improvements brought about by the implementation of CERP.

A major reason for issuing a report card so early in the implementation of CERP, even though system responses are not yet possible, is to assure the public that there will be regular reporting on the progress made towards meeting the restoration goals of CERP. It is important at this early stage to familiarize the public with the key indicators that are proposed to be used for this purpose, and to prompt public review and comment on the content and organization of this reporting document. An early objective of the report card is to make improvements in its content and organization in response to public reviews.

Monitoring and Assessment Plan

The first draft of the CERP *Monitoring and Assessment Plan* (MAP) (USACE and SFWMD, 2001) was released in March 2001, and underwent public and agency comment throughout the summer of 2001. The document has been substantially revised as a result of comments received as well as refinements in the monitoring protocols developed by a more recent set of workshops beginning in the fall of 2001. A second draft of the MAP will be released for formal agency and public review in September 2002.

The MAP establishes the framework for measuring systemwide responses and for assessing how well CERP is meeting its goals and objectives. Each CERP project will develop a separate, localized monitoring plan to assess the local performance of each individual project.

The development and refinement of the CERP MAP will be, by necessity, an iterative process. Periodic reviews and revisions of the MAP as new information becomes available will ensure the technical soundness of the plan and the continuing support of the participating agencies. RECOVER anticipates that formal reviews of the MAP will occur no less frequently than at three-year intervals.

The goal in implementing the MAP is to have a single, integrated, systemwide monitoring and assessment plan that will be used and supported by all participating agencies and tribal governments as the means of tracking and measuring the performance of CERP. The MAP presents the performance measures and parameters of the natural and human systems in South Florida that should be measured in order to determine the success of CERP. CERP performance measures must address the systemwide performance problems that CERP is explicitly designed to improve or correct. The draft document identifies the specific set of hydrologic, biological, and water quality performance measures that should be monitored; the geographic regions where these performance measures should be monitored; how each should be measured at what frequency; and the improvements in these performance measures that are predicted to occur during and following the implementation of CERP.

Numerous efforts have been mounted over the years to evaluate ecological, water quality and hydrological conditions and trends in South Florida. The draft MAP is built upon and incorporates the following three assumptions:

- The MAP will assess systemwide and regional-scale monitoring requirements (i.e., the MAP is not intended to satisfy project-specific (local) monitoring needs).
- Existing, relevant monitoring will continue.
- Partnering agencies will contribute funding and/or will participate in implementation of the MAP.

The draft MAP is organized into five sections. Sections one and two detail the purpose, developmental process, and objectives of the MAP and provide tables of the CERP performance measures. Section three presents a set of spatially discrete monitoring modules that outline integrated monitoring requirements. Sections four and five explain the plans for quality assurance and/or quality control (QA/QC), data management and evaluation requirements and procedures, and implementation and refinement needs and plans, respectively.

Monitoring Modules

During a series of 22 workshops from the fall of 2001 to the spring of 2002, Adaptive Assessment and Water Quality team members and other agency and academic scientists integrated the nine conceptual ecological models into a set of monitoring modules. A monitoring module for water supply and flood protection was developed independently. Each module contains the following sections: Summary and Introduction, Restoration Expectations, Monitoring Objectives, Methods (Sampling Protocols), Key Uncertainties and Research Topics and References. The five modules contained in the plan are as follows:

- Greater Everglades
- Northern Estuaries
- Southern Estuaries

- Lake Okeechobee
- Water Supply and Flood Protection

The individual performance measures associated with the monitoring modules that will be used in the monitoring and assessment process can be found in Table 7b-1-2, Appendix 7b-1. A brief description of the monitoring modules follows. The text below is taken from the draft document.

Greater Everglades Wetlands Module

The declines in wading birds, alligators and other higher vertebrates in the Everglades are largely attributed to breakdowns in aquatic trophic relationships that have diminished the abundance and availability of prey. These breakdowns have resulted from a combination of altered hydrology, salinity and nutrient patterns in the remaining wetlands and habitat loss in developed areas.

The restoration of natural patterns of hydrology, salinity and water quality in the remaining Everglades wetlands is expected to enhance the primary productivity of periphyton mats and mangrove forests. Periphyton mats and mangrove forests are considered to be regional indicators of the functional bases of food webs supporting the aquatic fauna that ultimately sustain reproduction by higher vertebrates.

The objectives of monitoring greater Everglades wetlands are to determine baseline conditions and variability, cause-effect relationships, unexpected responses and status and trends.

Monitoring methods for wetland landscape patterns will include vegetation mapping; ridge and slough measurements; tidal creek channel delineation, mapping, and volume measurement; and marl prairie/sparrow habitat measurements. Monitoring for wetland trophic relationships will include regional populations of fishes and associated fauna; seasonal concentrations of fishes and associated fauna; wading bird nesting; American alligator distribution; the American crocodile; the Cape Sable seaside sparrow; coastal salinity gradients and flow volume; regional hydrology; and surface water and soil nutrients.

Northern Estuaries Module

Altered freshwater inflows have affected circulation and salinity patterns in the Caloosahatchee and St. Lucie/Indian River Lagoon estuarine systems and have had adverse impacts on epibenthic communities and the fauna that utilize them as habitat. In achieving beneficial patterns of freshwater inflow, salinity and water quality, both estuaries share a common restoration expectation of healthier epibenthic communities that will support desired groups of estuarine fauna.

The monitoring objective is to determine if the restoration of beneficial patterns of freshwater inflow, salinity, and water quality to the Caloosahatchee Estuary, the St. Lucie Estuary, and the Indian River Lagoon will achieve the expected distribution, community structure, and viability of submerged aquatic vegetation (SAV) beds and oyster bars. Monitoring should also determine if the restoration of SAV and oysters would enhance habitat for desired estuarine fish communities and for juvenile stages of spotted sea trout.

Monitoring in the Caloosahatchee Estuary includes a general reconnaissance study of the area and specific attention to SAV, oysters, and water quality. Monitoring in the St. Lucie Estuary and

Indian River Lagoon includes oysters, SAV, benthos, juvenile fish, salinity and flow, and water quality.

The restoration expectations for the Loxahatchee Estuary are improved freshwater deliveries and pollutant loading to the estuary and improved water quality and salinity balance within the estuary. The restoration expectations for Lake Worth Lagoon are reduced loads of nutrients and contaminants (sediment and excessive freshwater) released to the lagoon by tributary waterways and improved water quality, sediment quality, and ecological conditions in the lagoon.

The objectives are to restore phytoplankton and macroinvertebrate communities to pre-eutrophic, stable salinity regime conditions, maintain “good” estuarine quality in the Loxahatchee Estuary and Lake Worth Lagoon and document reductions in loadings of nutrients, contaminants, and freshwater releases.

Southern Estuaries Module

Altered freshwater inflows have affected circulation and salinity patterns in Biscayne Bay, Florida Bay and the Everglades mangrove estuaries. Restoration of Biscayne Bay's epibenthic communities is expected primarily in the near-shore environment of the southern bay, including Barnes and Card Sounds, and should restore estuarine fish communities. The recovery of mixed seagrass beds in Florida Bay is expected to enhance nursery ground habitat values.

The objective of monitoring this module is to determine if the restoration of beneficial patterns of freshwater inflow, salinity, and water quality to South Florida estuaries will achieve the expected distribution, community structure, and viability of SAV beds and oyster bars. Monitoring should also determine if the restoration of SAV and oysters will enhance habitat for desired estuarine fish communities and for juvenile stages of pink shrimp and spotted sea trout.

Monitoring in Florida Bay will include SAV, salinity, pink shrimp/invertebrates, shoreline fish community, phosphorus and nitrogen. Monitoring in Biscayne Bay will include SAV, salinity, pink shrimp/invertebrates and the shoreline fish community.

Lake Okeechobee Module

Management of Lake Okeechobee within the constraints of the Herbert Hoover Dike has led to periods of extreme high and low water levels, resulting in large-scale losses of native submerged and emergent plant communities and synergistic negative effects with phosphorus. Reduction in lake water phosphorus is expected to bring about the ecological benefits of a reduction in the frequency and intensity of nuisance/toxic algal blooms, an increased diversity of benthic invertebrates, a reduced rate of cattail expansion and an increased spatial extent of submerged plants. Restoration expectations related to improved hydropatterns are expected to result in increased spatial extent and diversity of native submerged and emergent plant communities, improved quality of the associated periphyton and invertebrates and increases in the diversity and abundance of native fish, wading birds and other vertebrate populations that rely on these communities for habitat and food.

The monitoring objective for ecological assessment of the lake is to determine if the modified hydropattern and reduced phosphorus inputs projected to occur under CERP will allow for recovery of native plant and animal communities in the lake from their present degraded condition.

The monitoring objective for the water quality of the lake is to determine to what extent projects implemented under CERP result in improvements in water quality of Lake Okeechobee, its major tributary inflows, and, ultimately, the quality of water that is available for distribution from the lake for downstream uses.

Ecological monitoring will include littoral plant communities, submerged vegetation, invertebrates and forage fish, wading birds, alligators, fish, and snail kites. Water quality monitoring will include nutrients, ions, metals, pesticides, sediments, and flow.

Water Supply and Flood Protection Module

The primary target for flood protection is to maintain flood protection at the levels in existence on December 11, 2000 and in accordance with applicable law. The expectations for water supply are decreased seepage losses, decreased harmful releases of excess water from the natural system, and the prevention of saltwater intrusion into the Biscayne aquifer.

Monitoring for water supply should assess the short-term ability to meet water demands and identify how the demands were met. Monitoring flood control should assess real-time conditions and regional system operations.

Implementation of the Monitoring and Assessment Plan

Implementation of the MAP will consist of three major tasks: implementing and operating the monitoring and assessment program, managing RECOVER data in collaboration with the CERP Data Management Program, and assessing and reporting the monitoring data.

The initial sequencing of the MAP entails four main goals:

1. By 2005, establish all of the stations/projects necessary to measure the physical and chemical stressors (hydrological and water quality) identified in the MAP.
2. By 2005, close the gaps in high priority existing biological monitoring programs that are relevant to the MAP.
3. By 2005, initiate high priority baseline monitoring for the MAP.
4. By 2005, initiate high priority research to address uncertainties in system responses.

It is proposed that co-project managers from both the SFWMD and USACE will provide general oversight of the day-to-day operations and maintenance of the overall system. A multi-agency and multi-institutional Monitoring and Assessment Team will coordinate implementation of the monitoring and research projects for each of the five aforementioned modules. Working together, the coordinators and teams will be responsible for preparing a work plan and schedule for each monitoring package that lays out the logical order of activities, timelines, and approaches for accomplishing all the tasks and objectives of the monitoring program over the next three years.

Adaptive Management Program

The interagency RECOVER team has the responsibility to develop and implement a system-wide Adaptive Management Program in support of CERP. The purpose of the Adaptive Management Program is to create a set of measurable restoration objectives for CERP consistent with the goals of the plan, to assess how well CERP meets these objectives during and following

the implementation of the plan, and to identify opportunities to improve the design and operation of the Plan based on assessments of plan performance and on new information acquired through research and monitoring.

The overall Adaptive Management Program includes a set of interconnected tasks and products, which collectively provide RECOVER with the ability to apply the principle of adaptive management to CERP. These tasks and products include the development of conceptual ecological models of the natural systems of south Florida, a set of peer-reviewed and approved systemwide performance measures and restoration objectives, a systemwide monitoring plan, a data management and quality control strategy, and a data assessment protocol.

The *Draft CERP Performance Assessment Protocol Paper* (Appendix 7b-3) describes how RECOVER teams will organize and interpret new information obtained from systemwide and local monitoring and research programs in ways that will detect interim and final responses that are caused by CERP and other features of the C&SF Project. RECOVER will determine when these responses are undesirable relative to the CERP interim and final performance measures and restoration goals, and will use modeling to identify potential solutions to any performance problems.

Performance assessment reports will be issued periodically by RECOVER for the purposes of 1) reporting responses in the natural and human systems to the implementation of CERP, 2) identifying any performance problems attributable to the implementation of CERP, and 3) identifying potential options for resolving undesirable performance responses.

The assessment protocol will be further revised and formalized upon the codification of the programmatic regulations³ (DOD, 2002) called for in the Water Resources Development Act (WRDA) of 2000, and will serve as a precursor to an assessment guidance memorandum identified in the regulations.

Interim Goals

WRDA 2000 directs that the programmatic regulations (DOD, 2002) establish a process "to ensure the protection of the natural system consistent with the goals and purposes of the Plan..." (sec. 601 (h)(C)(i)(III)). The vehicle for this assurance is the establishment of quantitative interim goals through which the restoration success of the plan may be evaluated incrementally as implementation of CERP proceeds.

A self-selected subteam of RECOVER members worked in the fall of 2001 to develop a process for RECOVER to follow in the establishment of interim goals. A final draft *Process to Establish and Refine Interim Goals for the Comprehensive Everglades Restoration Plan* was issued in December 2001 and is included here as Appendix 7b-4. Since that time, the team has

³ Section 601 of WRDA 2000 requires the Secretary of the Army to promulgate programmatic regulations to ensure that the goals and purposes of CERP are achieved. The regulations establish the administrative structure for implementing the plan by instituting processes to be carried out throughout the implementation period. The draft regulations were published in the Federal Register on August 2, 2002 and are undergoing a 60-day comment period.

developed criteria for choosing indicators for the interim goals. The criteria the team agreed upon for the selection of indicators are as follows:

- Indicators should be consistent with goals and purposes of CERP.
- Indicators should address the physical aspects (quantity, quality, timing, or distribution of water).
- There should be biological indicators (use the Total System Model attributes as a guide).
- Indicators should include a balance of short, intermediate and long-term responders.
- Indicators should be consistent with the MAP.
- Indicators should be predictable and interpretable.

The subteam will continue to work through the process for developing the interim goals, with the next step being the selection of the actual indicators. The public, stakeholders and other interested parties will be asked to provide input and comment on the selected indicators.

PLANNING AND INTEGRATION

Implementation of CERP will take place over an estimated 30-year period. The magnitude of CERP, as well as direction from the U.S. Congress and the Florida Legislature, necessitates that a process to incorporate changing conditions, new information and other factors that may affect the performance of CERP be put into practice. An effort known as the "Initial CERP Update" is a first step in assuring that new technical information is integrated into the implementation of the plan.

The purpose of the Initial CERP Update is to respond to a changed environment and new information gained since the CERP feasibility report was released (USACE and SFWMD, 1999). Since that time, work has continued on several fronts relating to the implementation of the plan. Performance measures and indicator regions for the natural system, which are used to predict plan performance, have been revised. Upgrades have been made and new data has been added to the SFWMM and NSM, which are the primary hydrologic tools used in plan formulation and evaluation. Seven years have passed since the development of the "Restudy" existing condition and there have been changes in assumptions for the future without project condition. For these reasons and others, the plan needs to be evaluated and updated with this new information.

The Initial CERP Update will result in a clearer picture of plan performance, a revised existing condition using 2000 data and revised future without project condition. Moreover, this information will be provided to the individual CERP project delivery teams (PDTs) as they begin project-level formulation and evaluation.

The Comprehensive Plan Refinement Team within RECOVER is the team that will lead and coordinate the interagency, interdisciplinary Initial CERP Update Team. The effort will be supported by RECOVER's other technical teams and agency resources. In general, the Initial CERP Update Team make-up is representative of the multiagency and tribal participants in RECOVER. The team will perform the analyses necessary to carry out the update and will document all actions and findings in a technical report.

The RECOVER program managers will communicate the findings of the Initial CERP Update Team to the appropriate senior-level management within the USACE and the SFWMD. Management in turn will then provide guidance and direction for any future actions necessary back to the RECOVER managers. Due to the nature of the Initial CERP Update, close coordination with stakeholders and others will be of paramount importance.

It was originally envisioned that the Initial CERP Update would include operational optimization of CERP, a step not performed during the development of the feasibility report due to time constraints. After hearing concerns that such "optimization" constitutes an actual change to CERP, the decision was made to end update activities with the issuance of the technical documentation. It will be a management decision whether to proceed with the optimization exercise. If it does proceed, the National Environmental Policy Act (NEPA) process will be initiated.

Major Milestones

The major milestones for the Initial CERP Update are presented in **Table 7-1**.

Table 7-1. Initial CERP update milestones

Task	Date
Data gathering and assimilation	
1. Define assumptions for CERP Existing and Future Without Project Conditions	August 02
2. Update 2000 and 2050 land use/land cover	September 02
3. Update population projections	September 02
Upgrade simulation models	
1. Extend climatic period of record from 31 to 36 years	June 02
2. Incorporate latest topography (SFWMM v5.0 & NSM v5.0)	June 02
3. Calibrate and verify (SFWMM v5.0)	July 02
4. Technical review of SFWMM v5.0 & NSM v5.0	September 02
5. Compare NSM v3.5 & NSM v5.0	September 02
Evaluate CERP	
1. Simulate CERP Planning Conditions and compare to Restudy 1995 and 2050	October 02
2. Simulate the Comprehensive Plan with SFWMM v5.0; compare to Restudy	Winter 02
Technical Documentation	
1. Prepare technical report	Winter 02/03

Related Efforts

Three efforts are linked to the Initial CERP Update: incremental modeling of the CERP Master Implementation Schedule, ASR Contingency Planning and the development of the pre-CERP baseline. All three of these activities will rely heavily on the use of computer simulation modeling. The implementation schedule has been modified from that contained within the 1999 feasibility report (USACE and SFWMD, 1999) and there is a desire to understand what these changes mean hydrologically. It is envisioned that the modeling effort will analyze the currently scheduled sequence of construction projects at five-year increments. This work will also form the foundation for establishing Interim Goals.

The second effort, ASR Contingency Planning, will entail the formulation and evaluation of two planning scenarios. One scenario will be to take 100% of the ASR in the CERP out of the plan, the second will be to take 50% out. For both scenarios, features will be added back into the plan in an attempt to realize the same level of performance as in the original CERP.

The programmatic regulations (DOD, 2002) call for the development of a pre-CERP baseline that represents the conditions in the region on the date of enactment of WDRA 2000, accounting for natural variations and including existing legal sources of water. The baseline will establish the amount of water delivered by the C&SF Project, which is of central importance to ensuring attainment of the benefits of the Plan. All projects must evaluate the any changes in the pre-CERP baseline water availability in identifying the quantity, timing and distribution of water to be made available to the natural system.

LITERATURE CITED

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